a total of 40 telegraph channels, two-way phone channel, and two-way facsimile channel. F quency modulation is used and e telegraph signal goes out as frequencies; one is a marking pulse and the other a spacing pu to the receiving printer. A 70 cy swing of signals spaced 300 cy apart is involved.

Progress

In its six months operation date, the radio relay circuit performed so well that West Union has filed an application

One of the 4,000-mc antennas is amined by H. P. Corwith, assist chief engineer of Western Union

the FCC for permission to ins equipment of a similar type fro New York to Pittsburgh, Pitt burgh to Washington, Washingt to New York, and New York Philadelphia. Its establishment time will permit the removal about 2500 miles of pole lines wi some 54,000 miles of wires and miles of aerial and undergrou cable.

Besides terminal equipment the four cities, 21 intermediate lay stations in towers on m tains ranging from 14 to 55 m apart would be constructed. sites for these have been acqui

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Tube for SCR 270 Radar

COOPERATIVE ACTIVITY between Army Signal Corps and We house Electric Corp. produced special radar tube shown in

accompanying illustrations. It wa used in long-range detection sets one of which revealed the impend ing attack on Pearl Harbor an another guarded the Panama Cana a year before.

Of revolutionary design, the tub produced ten times the power o uhf tubes previously built and in

Finished example of type WL 530 radar tube. This unit served in the famous SCR 270 which detected the approaching Japanese attackers of Pearl Harbor Production of copper-to-glass seal was one of the difficult parts in development of the WL 530 radar tube. Here a worker in the Fairmont, W. Va., plant of Westinghouse molds the anode seal

volved manufacturing problems at first regarded as insurmountable. Besides geometrical and physical characteristics departing radically from known techniques, the tube called for extremely difficult copper-to-glass feather-edge seals and momentary peak currents which de-

manded a specially-treated
sten filament able to withstand
times the voltages believed pos

The project was taken over
Westinghouse electronic engi
Ilia E. Mouromtseff, who had,
in 1933, done line-of-sight tr
mission work which led to the
tection of automobiles passing
on the highway outside the
Pittsburgh plant of the com
Tubes of similar construction
expected to contribute to the
advancement of f-m and televi
equipment.

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Drafting Aids to Relay Profiling

By F. J. BINGLEY
Chief Television Engineer
Philco Radio & Television Corp.
Philadelphia, Pa.

PROFILING of the terrain along
line-of-sight television path
cently built between Washing
and Philadelphia (See ELECTR
ICS, Oct. 1945) was necessary
cause it was desired to obtain
least 100 feet of ground clearan
at all points on the transmiss
path. This clearance was to be p
vided by the use of two 100-foot a
tenna towers, one for receiving a
the other for transmitting telev
sion signals at each relay site s
lected.

After a study of U. S. Coast a
Geodetic Survey maps, four tent
tive hilltop sites for relay station
were chosen. Then a device, which
has been named the Contourograp
was used to prepare profiles of th
ground contour between each pa
of sites to learn the exact groun
clearance along each section of th
proposed network.

The instrument is shown in the
accompanying illustration. It con
sists of a double-ended T-squar
actually an H-square, with an adde
cursor. The two vertical legs o
the H are used to mark on the ma
the two end points of a path whic
is to be profiled, with one le
movable to permit adjustments i
the length of the contour section

Distance and Elevation

The slider which is moved alon
the horizontal leg of the H-square
is graduated in feet of altitude
an arbitrary scale. Thus as it